CLAIMS

1 A Server for allowing a user to connect to services using a remote terminal, the Server being coupled to the remote terminal via one of a number of communications links and to the one or more services in use, the Server including:

a) A store for storing device data, the device data including an indication of an identifier for each of a number of predetermined terminals authorised to access the remote services;

b) An authentication system, the authentication system being adapted to:

(i) Obtain an identifier from the terminal; and,

(ii) Compare the identifier of the terminal to the device data; and,

(iii) Establish a connection between the Server and the terminal via at least one of the communication links, in response to the successful comparison;

c) A cache store including:

(i) A first cache adapted to store data transmitted to the terminal; and,

(ii) A second cache adapted to store data received from the terminal; and,

d) A switching system, the switching system being adapted to:

(i) Receive an alternative connection request from the terminal, the alternative connection request indicating that an alternative connection is to be established; and,

(ii) Cooperate with the terminal to establish the alternative connection in response to the request;

e) A security system, the security system being adapted to perform at least one of:

(i) Encoding data to be transmitted to the terminal in accordance with the data stored in the cache store; or,

(ii) Decoding data received from the terminal in accordance with the data stored in the cache store.

2 A Server according to claim 1, the security system being adapted to encode data by compressing and then encrypting the data.

3 A Server according to claim 1 or claim 2, the security system being adapted to decode data by decrypting and then decompressing the data.

4 A Server according to any one of the claims 1 to 3, the terminal having a corresponding cache store, the corresponding cache store being adapted to be identical to the cache store.

5 A Server according to any one of the claims 1 to 4, each cache and corresponding cache being adapted to store predetermined secret data.

6 A Server according to any one of the claims 1 to 5, the security system being adapted to compress the data to be transferred by:

a) Comparing the data to be transferred to the data stored in the first cache; and,

b) Determining matching data in accordance with the results of the comparison;

c) Modifying the data to be transmitted by replacing the matching data with a cache reference, the terminal being adapted to be responsive to the transmitted data to replace the cache references with the matching data from the corresponding first cache.

7 A Server according to any one of the claims 1 to 6, the security system being adapted to decompress data received from the terminal by:

a) Locating cache references in the received data, the cache references being generated by the terminal in accordance with data contained in the corresponding second cache;

b) Accessing the data stored in the second cache;

c) Modifying the received data by replacing the cache references with matching data with a cache store reference, the terminal including a corresponding cache store and being adapted to be responsive to the transmitted data to replace the cache store references with the matching data from the corresponding cache store.

8 A Server according to any one of the claims 1 to 7, the security system being adapted to encrypt/decrypt data the data to be transferred by:

a) Generating an encryption/decryption factor in accordance with the selected data stored in the cache store; and,

b) Encrypting/decrypting the compressed data in accordance with the generated encryption/decryption factor.

9 A Server according to claim 8, the encryption/decryption factor being based on a checksum of the data contained in the first/second cache.

10 A Server according to claim 9, the encryption/decryption factor being used to generate an encryption/decryption key, the key being used in a encryption/decryption algorithm.

11 A Server according to any one of the claims 1 to 10, the cache store system being adapted to select the transmitted data to be stored.

12 A Server according to claim 11, the cache store system being adapted to select the data in accordance with at least one of a number of criteria including:

a) Transmission frequency of the data;

b) The communications link used to transmit the data;

c) The data volume;

d) Any QOS requirements for the data transmission; or,

e) Any priority requirements for the data transmission.

13 A Server according to any one of the claims 1 to 12, the connections links including at least one of:

a) A cellular connection;

b) A short range wireless connection;

c) c) A LAN connection;

d) A fixed line/wired connection; or,

e) An Internet connection.

14 A Server according to any one of the claims 1 to 13, at least one of the communications links being established as a tunnel connection with the terminal.

15 A Server according to any one of the claims 1 to 14, the store being adapted to store user data, the user data including a user identifier for each user authorised to access the remote services, the authentication system being adapted to:

a) Receive a user identifier from the terminal;

b) Compare the user identifier to the user data; and,

c) Establish the connection in response to a successful comparison.

16 A Server according to claim 15, the unique identifier being a username and password.

17 A Server according to claim 15 or claim 16, the authentication system and the switching system being adapted to provide one time authentication such that the unique identifier is not required when an alternative connection is to be established.

18 A Server according to any one of the claims 1 to 17, the cache store including a number of first and second caches, at least one respective first and second cache being used for each terminal adapted to be connected to the Server.

19 A Server according to claim 18, the connection being used to transfer a number of different data types, a respective first and second cache being used for each data type.

20 A Server according to any one of the claims 1 to 19, the Server including a converter, the converter being adapted to receive data having a first form and output data having a second form.

21 A Server according to claim 20, the converter being accepted to receive UDP data from the Internet and transfer the data to the terminal as TCP data.

22 A Server according to any one of the claims 1 to 21, the identifier including a digital signature generated by the terminal in accordance with a respective secret key and predetermined information, the authentication system being adapted to:

a) Determine a public key corresponding to the respective private key from the device data;

b) Decrypt the digital signature using the determined public key; and,

c) Compare the decrypted digital signature with the predetermined information.

23 A Server according to claim 22, the predetermined information being obtained from the cache store.

24 A Server according to any one of the claims 1 to 23, the data being transferred to and from the Server in accordance with an address, the Server including an address system, the address system being adapted to:

a) Determine a first address for the terminal, the first address being defined in accordance with the established connection;

b) Determine a second address for the terminal;

c) Store the first and second addresses in the store; and,

d) Cause the Server to:

(i) Receive data from the services for the terminal in accordance with the second address; and,

(ii) Transfer the data to the terminal in accordance with the first address.

25 A Server according to claim 24, the address system being adapted to:

a) Determine alterations of the first address of the terminal; and,

b) Update the first address stored in the store in accordance with the alterations.

26 A Server according to any one of the claims 1 to 25, the switching system being adapted to:

a) Detect failure of the established connection between the Server and the terminal; or,

b) Maintain any links between the Server and respective services in communication with the terminal until the connection is restored.

27 A Server according to any one of the claims 1 to 26, the Server including a processor, the processor being adapted to implement at least one of:

a) The authentication system;

b) The switching system; or,

c) The security system.

28 A Server according to any one of the claims 1 to 27, the services including:

a) Access to one or more processing systems;

b) Access to one or more communications networks;

c) Access to one or more databases; and,

d) The Internet.

29 A terminal adapted to communicate with a Server for allowing a user to connect to services, the terminal being coupled to the Server via one of a number of communications links and to the one or more services in use, the terminal including:

a) A store for storing device data, the device data including an indication of an identifier for the terminal;

b) An authentication system, the authentication system being adapted to:

(i) Generate an identifier in accordance with the device data; and,

(ii) Transfer the identifier to the Server, the Server responding to the identifier to determine if the terminal is authorised to access the remote services and, establish a connection between the Server and the terminal via at least one of the communication links, in response to the successful determination;

c) A cache store including:

(i) A first cache adapted to store data transmitted to the terminal; and,

(ii) A second cache adapted to store data received from the terminal;

d) A switching system, the switching system being adapted to:

(i) Determine if an alternative connection can be established via one or more alternative communications links;

(ii) Compare the alternative connection to the existing connection; and,

(iii) Transfer an alternative connection request to the Server;

(iv) Cooperate with the Server to establish the alternative connection; and,

e) A security system, the security system being adapted to perform at least one of:

(i) Encoding data to be transmitted to the Server in accordance with the data stored in the cache store; or,

(ii) Decoding data received from the Server in accordance with the data stored in the cache store.

30 A terminal according to claim 29, the terminal being adapted to communicate with the Server of any one of the claims 1 to 28.

31 A terminal according to claim 29 or claim 30, the Server having a corresponding cache store, the corresponding cache store being adapted to be identical to the cache store.

32 A terminal according to any one of the claims 29 to 31, each cache and corresponding cache being adapted to store predetermined secret data.

33 A terminal according to any one of the claims 29 to 32, the terminal being adapted to compare the alternative connection to the existing connection by comparing at least one of:

a) The connection bandwidth;
b) The connection cost;
c) The connection speed; or,
d) A connection reliability.

34 A terminal according to any one of the claims 29 to 33, the security system being adapted to compress the data to be transferred by:

a) Comparing the data to be transferred to the data stored in the first cache; and,
b) Determining matching data in accordance with the results of the comparison;
c) Modifying the data to be transmitted by replacing the matching data with a cache reference, the Server being adapted to be responsive to the transmitted data to replace the cache references with the matching data from the corresponding first cache.

35 A terminal according to any one of the claims 29 to 34, the security system being adapted to decompress data received from the Server by:

a) Locating cache references in the received data, the cache references being generated by the Server in accordance with data contained in the corresponding second cache;

b) Accessing the data stored in the second cache;

c) Modifying the received data by replacing the cache references with matching data with a cache store reference, the terminal including a corresponding cache store and being adapted to be responsive to the transmitted data to replace the cache store references with the matching data from the corresponding cache store.

36 A terminal according to any one of the claims 29 to 35, the security system being adapted to encrypt/decrypt data the data to be transferred by:

a) Generating an encryption/decryption factor in accordance with the selected data stored in the cache store; and,

b) Encrypting/decrypting the compressed data in accordance with the generated encryption/decryption factor.

37 A terminal according to claim 36, the encryption/decryption factor being based on a checksum of the data contained in the first/second cache.

38 A terminal according to claim 37, the encryption/decryption factor being used to generate an encryption/decryption key, the key being used in a encryption/decryption algorithm.

39 A terminal according to any one of the claims 29 to 38, the cache store system being adapted to select the transmitted data to be stored.

40 A terminal according to claim 39, the cache store system being adapted to select the data in accordance with at least one of a number of criteria including:

a) Transmission frequency of the data;
b) The communications link used to transmit the data;
c) The data volume;
d) Any QOS requirements for the data transmission; or,
e) Any priority requirements for the data transmission. A

41 A terminal according to any one of the claims 29 to 40, the connections links including at least one of:
a) A cellular connection;
b) A short range wireless connection;
c) A LAN connection;
d) A fixed/wired connection; or,
e) An Internet connection.

42 A terminal according to any one of the claims 29 to 41, at least one of the communications links being established as a tunnel connection with the terminal.

43 A system for allowing a user to connect to services using a remote terminal coupled to a Server via one of a number of communications links, the Server being coupled to the one or more services in use, the system including a Server according to any one of the claims 1 to 28, and a terminal according to any one of the claims 29 to 42.

44 A method of allowing a user to connect to services using a terminal coupled to a Server via one of a number of communications links, the Server being coupled to the one or more services in use, the method including causing the Server to:
a) Authenticate the terminal by:
(i) Obtaining an identifier from the terminal; and,
(ii) Comparing the identifier of the terminal to device data, the device data being stored in a store, the device data including an indication of an identifier for each of a number of predetermined terminals authorised to access the remote services; and,
(iii) Establishing a connection between the Server and the terminal via at least one of the communication links, in response to the successful comparison;

b) Store data in a respective cache store, the cache store including:

(i) A first cache adapted to store data transmitted to the terminal; and,

(ii) A second cache adapted to store data received from the terminal; and,

c) Operate to switch the connection by:

(i) Determining if an alternative connection can be established via one or more alternative communications links;

(ii) Comparing the alternative connection to the existing connection; and,

(iii) Establishing the alternative connection in response to a successful comparison;

d) Secure the data by performing at least one of:

(i) Encoding data to be transmitted to the terminal in accordance with the data stored in the cache store; or,

(ii) Decoding data received from the terminal in accordance with the data stored in the cache store.

45 A method according to claim 44, the method including causing the Server to operate as a Server according to any one of the claims 1 to 28.

46 A method of allowing a user to connect to services using a terminal coupled to a Server via one of a number of communications links, the Server being coupled to the one or more services in use, the method including causing the terminal to:

a) Participate in authentication by:

(i) Generating an identifier in accordance with device data, the device data including an indication of an identifier for the terminal;

(ii) Transfer the identifier to the Server, the Server responding to the identifier to determine if the terminal is authorised to access the remote services and, establish a connection between the Server and the terminal via at least one of the communication links, in response to the successful determination;

b) Store data in a respective cache store, the cache store including:

(i) A first cache adapted to store data transmitted to the terminal; and,

(ii) A second cache adapted to store data received from the terminal; and,

c) Operate to switch the connection by:

(i) Determining if an alternative connection can be established via one or more alternative communications links;

(ii) Comparing the alternative connection to the existing connection; and,

(iii) Transferring an alternative connection request to the Server;

(iv) Cooperating with the Server to establish the alternative connection; and,

d) Secure the data by performing at least one of:

(i) Encoding data to be transmitted to the Server in accordance with the data stored in the cache store; or,

(ii) Decoding data received from the Server in accordance with the data stored in the cache store.

47 A method according to claim 46, the method including causing the terminal to operate as a terminal according to any one of the claims 29 to 43.